

REMARKS

This application is in condition for allowance for the reasons that follow.

Status of the Claims

Claim 27 is amended to delete "1-10%" for the other monosaccharides, which was a typographical error. The range "0-10%" as presently amended is consistent with the originally recited range, and dependent claims, e.g. claim 28. This is the same amendment in the previously filed amendment of May 23, 2011, which was not entered because the application was withdrawn from appeal.

Claims 27-29, 31-44, 48-50, 52 remain in this application.

Claims 31-34, 38 and 40 stand withdrawn.

Claim Rejections-35 USC §112

Claims 35-37 were rejected under 35 U.S.C. §112, first paragraph, for not complying with the enablement requirement.

This rejection is respectfully traversed.

The information contained in the disclosure is sufficient to inform those of ordinary skill in the art how to both make and use the claimed invention.

A practitioner with ordinary skill in the art understands from the description starting on page 21, line 13

that the described protocol without restriction relates to all *Aloe vera* extracts and reconstituted powders described in the application. In particular, lines 13-18 of page 21 describes all necessary steps for the preparation of NAG-25 extracts from *Aloe* gel extracts or reconstituted powders for a practitioner with ordinary skill in the art. It is common general knowledge that insoluble materials that may be present in the extracts or reconstituted powders will have to be removed by centrifugation. Also it will be clear to the practitioner that filtration over a 0.2 μ m membrane is a standard and common step when biological materials are studied in order to remove bacteria. Finally, a practitioner with ordinary skill in the art also knows how to apply Sephadex G-25, i.e. how to prepare a small bed volume of Sephadex G-25, and to collect the non-binding fraction, i.e. the eluate. Such a practitioner, in fact, can do so without the additional description on page 22, lines 14-20.

The *Aloe vera* extracts used are commercial products and hence available to the public. The description particularly refers to the company Bioclin B.V. as a commercial source for the *Aloe vera* extracts on page 20, line 22.

For the above reasons, the claims comply with the enablement requirement, and withdrawal of the rejection is respectfully requested.

Claim Rejections-35 USC §103

Claims 27-29, 35-37, 39, 41-44, 48-50 and 52 were rejected under 35 U.S.C. § 103(a) over YARON et al. J. Agric. Food Chem 1992 (YARON) in view of HART et al. 1989, Planta Medica, 55: 509-512 (HART).

This rejection is respectfully traversed.

The inventors have long and extensively studied Aloe vera and have first found that a particular polysaccharide fraction from Aloe vera demonstrates very promising curative properties. These promising polysaccharides were those as claimed in present claim 27, having a molecular weight higher than 50 kD, being negatively charged, and being formed from specific monosaccharides in specific percentages. This polysaccharide fraction proved to give better results as compared to similar polysaccharide fractions that consisted of non negatively charged polysaccharides, and/or polysaccharides having a molecular weight lower than 50 KD, and/or polysaccharides comprising different monosaccharide compositions (i.e. other types of monosaccharides or other percentages). These results are demonstrated with several experiments and results as described in the application, for instance table 1 and figure 4.

YARON and HART fail to disclose or suggest this particular polysaccharide fraction from Aloe vera, and fail to disclose or suggest the improved curative properties of this particular polysaccharide fraction.

To be precise, YARON, although concerned with *Aloe vera*, does not relate to improved polysaccharide fractions from *Aloe vera*, but instead relates to improving *Aloe vera* gels by stabilizing the network structure of *Aloe vera* polysaccharides by addition of other components. In fact, YARON describes mixtures of *Aloe vera* gel with anionic polysaccharides from exogenous sources: microalgae *R. reticula*, *Porphyridium* sp and *P. aerigineum* as well as xanthan gum and gear gum (Table 1, p. 1317). These anionic polysaccharides are clearly not from *Aloe vera*. YARON fails to disclose negatively charged polysaccharides derived from *Aloe vera*. Furthermore, the anionic polysaccharides of YARON differ strongly in composition and structure from the polysaccharides known to be present in *Aloe vera* gels.

For instance, the red unicellular alga *Porphyridium* sp polysaccharide is a sulfated poly-galactoxylose with the following repeating unit (Gloaguen V et al., Carbohydrate Res, 333 (2004) 97-103):



Also, xanthan gum polysaccharide has a backbone structure of beta(1-4)-linked glucose residues (like in cellulose), with side chains containing mannose and glucuronic acid; the latter determines the negative charge of the polysaccharide. The

glucose/mannose/ glucuronic acid ratio is commonly known to be 1:≤1:≤0.5 (see, e.g. http://en.wikipedia.org/wiki/Xanthan_gum). Finally guar gum is a galactomannan; the mannose/galactose ratio is 2:1. These particular compositions have not been described for polysaccharides in Aloe vera gel preparations. Xylose and galactose are minor constituents of the polysaccharides present in Aloe vera gels and sulfate is not detected (Femenia A. et al, Carbohydrate polymers, 39 (1999) 109-117, Tables 3-5).

Hence, YARON fails to disclose the specific polysaccharides as claimed in claim 27, and YARON does not at all suggest isolating such polysaccharides from Aloe vera.

The document by HART admittedly does relate to improved polysaccharide fractions derived from Aloe vera. However, the polysaccharide fraction described by HART is clearly different from the polysaccharide fraction as claimed since both examples BI and BII in HART comprise only a minor amount of glucose, 3.2% and 3.9% respectively. The polysaccharides of the claimed invention in contrast comprise 10 - 30% glucose. Due to the low glucose content, the mannose:glucose ratio of the polysaccharide fraction of HART also differs from that of the present invention, namely 89:3 and 22:1 respectively instead of between 5:1 and 20:1. The ratio of 1:5.1 to 1:19 cited in the Office Action does not relate to the polysaccharides of HART, but the ratio is described in another document by GOWDA. HART further describes a

different isolation method, resulting in the different polysaccharide fraction. Moreover, HART also fails to disclose that the polysaccharides have a surprising inhibitory effect on adherence of microorganisms to the surface of host tissue, which renders the polysaccharides of the claimed invention suitable in anti-infective compositions.

Further, the claimed invention is not based on general conditions that are optimized by routine experimentation. The claimed invention relates to polysaccharides derived from *Aloe vera*, which accordingly are a natural product. Such polysaccharides cannot simply be reproduced by mixing the monosaccharides in the appropriate percentages or any other purported routine practice. In fact, with modern techniques it is still impossible to reproduce the natural polysaccharides. In this regard, Dr. van Dijk, one of the named inventors, has provided a discussion concerning biosynthesis and polysaccharide structures (See the Appendix.)

In view of the above, the proposed combination of YARON and HART is not able to render obvious the claimed features of independent claims 27 and 52. Therefore, the rejection of claims 27-29, 35-37, 39, 41-44, 48-50 and 52 should be withdrawn.

Conclusion

In view of the foregoing remarks, this application is in condition for allowance at the time of the next Official

Action. Allowance and passage to issue on that basis is respectfully requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future submissions, to charge any deficiency or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following item(s):

- ☐ - "Background about biosynthesis and structures of polysaccharides" by Dr. van Dijk, one of the named inventors.